



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/594,153

08/06/2007

Masanobu Kusunoki

SAK-5524

6069

24956 7590 03/26/2012
MATTINGLY & MALUR, PC
1800 DIAGONAL ROAD
SUITE 370
ALEXANDRIA, VA 22314

EXAMINER

BAND, MICHAEL A

ART UNIT

PAPER NUMBER

1723

MAIL DATE

DELIVERY MODE

03/26/2012

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/594,153

Applicant(s)

KUSUNOKI ET AL.

Examiner

MICHAEL BAND

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 1 and 3-12 is/are pending in the application.
- 5a) Of the above claim(s) 6-12 is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1 and 3-5 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-832)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/8/2011 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

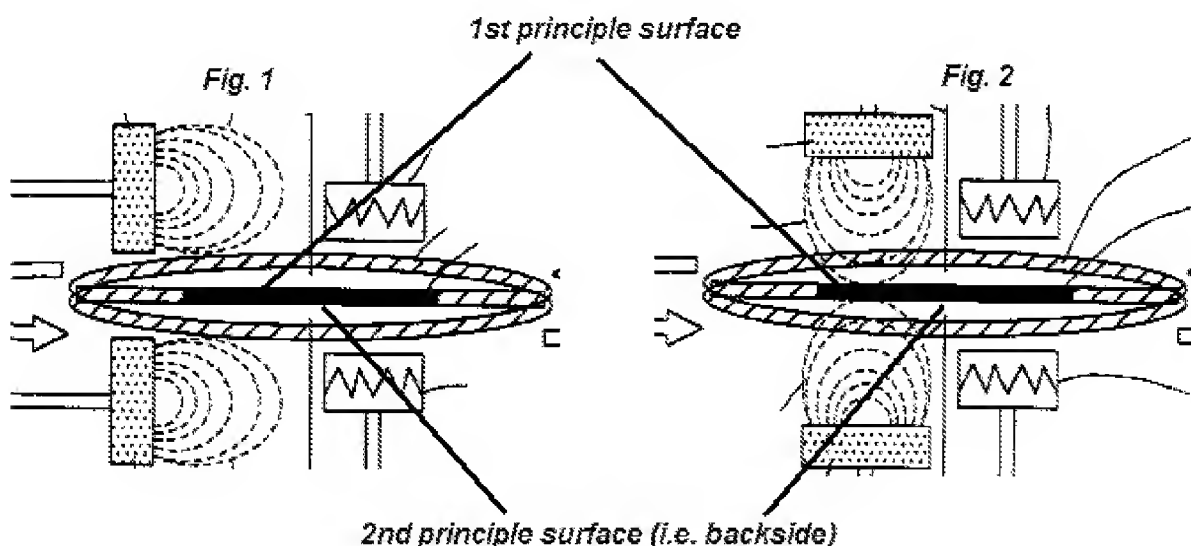
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suh et al (US Patent No. 6,280,580).

With respect to claims 1 and 3-5, Suh et al discloses a method of manufacturing a double-sided metal superconducting oxide thin film (abstract; col. 2, lines 56-58), where figs. 1-2 depicts sputter targets [1],[2] depositing material onto a first principle surface and a second principle surface (i.e. backside) of a substrate [6] where substrate heaters [3],[4] face the first principle surface and the second principle surface. Figs. 1-2

Art Unit: 1723

further depict the substrate [6] rotated about an axis that is normal to the first principle surface, with the axis represented by guides [9], [10]. Suh et al also discloses introducing the material onto the first and second principle surfaces, which includes the substrate heaters [3],[4] to crystallize the material (i.e. converging atoms of the material into crystal form) by converging the material near center areas of the first and second surfaces via guides [9],[10] (col. 2, lines 66-67; col. 3, lines 1-5 and 31-37). Therefore since Suh et al discloses the claimed exposing, introducing, and converging via guides [9],[10] on the first and second principle surface, it is obvious that the material exhibits the property of increased density, as supported by Applicant's Specification (see USPGPub 2008/0076269; para 0063). If not, it must be due to a claim requirement not currently present. The cropped figures below of figs. 1-2 serve to further clarify the first and second the second principal surface.



4. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura (US Patent No. 5,183,510) in view of Suh et al (US Patent No. 6,280,580).

With respect to claims 1 and 3-5, Kimura discloses a process for forming a thin film of a superconductor oxide (abstract; col. 5, lines 13-15), where fig. 2a depicts four film sources [2a]-[2d] heated via respective heater elements [3a]-[3d] to form vapor particulate materials where all vapor particulate materials are converged via guides [101],[110] onto an exposed first principal surface of a substrate [5]. Fig. 2b further depicts a heater [3e] surrounding the first principal surface and a bottom (i.e. second principal surface) of the substrate [5] (col. 5, lines 43-50). Although Kimura only discloses one heater that surrounds the first and second principal surfaces (figs.2a-b), it would be obvious to one of ordinary skill to use multiple heaters to surround the first and second surfaces to yield the predictable result of heating the first and second surfaces in addition to better control of the film forming process by individually controlling the heat on different areas of the first and second surfaces. Kimura further discloses that in an alternative embodiment, a mechanism can be incorporated for rotating the substrate [5] (col. 6, lines 1-11). Although Kimura does not specify a rotation axis, it would be obvious to one of ordinary skill to have the mechanism rotate the substrate [5] on an axis normal to the first and second principal surfaces to more uniformly coat the entire first principal surface from the four film sources [2a]-[2d] located on a left side of the substrate [5]. However Kimura is limited in that also depositing onto the second principal surface simultaneously with the first principal surface is not suggested.

Suh et al teaches a process for forming a double-sided metal superconducting oxide thin film (abstract; col. 2, lines 56-58), where figs. 1-2 depicts two film sources [1],[2] simultaneously depositing material onto first and second principle surfaces of a

substrate [6] held on a substrate support [6] via physical vapor deposition (i.e. sputtering) where substrate heaters [3],[4] face the first principle surface and the second principle surface and the substrate [5] is rotated about an axis normal to the first and second surfaces. Suh et al cites the advantage as using the substrate holder as applying a superconducting oxide film onto both surfaces of a substrate instead of one (col. 1, lines 34-38).

It would have been obvious to one of ordinary skill in the art to incorporate the substrate holder taught by Suh et al instead of the substrate holder of Kimura to gain the advantage of applying the superconducting oxide film onto both sides of the substrate instead of only one.

5. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura (US Patent No. 5,183,510) in view of Nagaishi et al (US Patent No. 5,624,722).

With respect to claims 1 and 3-5, Kimura discloses a process for forming a thin film of a superconductor oxide (abstract; col. 5, lines 13-15), where fig. 2a depicts four film sources [2a]-[2d] heated via respective heater elements [3a]-[3d] to form vapor particulate materials where all vapor particulate materials are converged via guides [101],[110] onto an exposed first principal surface of a substrate [5]. Fig. 2b further depicts a heater [3e] surrounding the first principal surface and a bottom (i.e. second principal surface) of the substrate [5] (col. 5, lines 43-50). Although Kimura only discloses one heater that surrounds the first and second principal surfaces (figs.2a-b), it would be obvious to one of ordinary skill to use multiple heaters to surround the first and

Art Unit: 1723

second surfaces to yield the predictable result of heating the first and second surfaces in addition better control of the film forming process by individually controlling the heat on different areas of the first and second surfaces. Kimura further discloses that in an alternative embodiment, a mechanism can be incorporated for rotating the substrate [5] (col. 6, lines 1-11). Although Kimura does not specify a rotation axis, it would be obvious to one of ordinary skill to have the mechanism rotate the substrate [5] on an axis normal to the first and second principal surfaces to more uniformly coat the entire first principal surface from the four film sources [2a]-[2d] located on a left side of the substrate [5]. However Kimura is limited in that also depositing onto the second principal surface simultaneously with the first principal surface is not suggested.

Nagaishi et al teaches a method for depositing superconducting oxide films onto a first principal surface via vapor plume [234a] and second principal surface via vapor plume [234b] of a substrate [208], where the vapor plumes [234a],[234b] are formed by subliming film sources [212a], [212b] via heating (abstract; fig. 3; col. 12, lines 15-22; col. 13, lines 6-17). Nagaishi et al further teaches that the substrate [208] can move along two axes in axial horizontal and vertical directions to uniformly coat the substrate [208] from the film sources [212a],[212b] (col. 6, lines 44-48), where fig. 3 depicts a heater [216] facing the first principal surface of the substrate [508] and another heater [218] facing the second principal surface of the substrate [208]. Nagaishi et al cites the advantage of depositing onto the first and second principal surfaces simultaneously as forming superconducting oxide films with excellent quality and uniform thickness

Art Unit: 1723

distribution in one process without any adhesion process to form devices with favorable characteristics and improved reliability (col. 3, lines 51-59; col. 4, lines 1-5).

It would have been obvious to one of ordinary skill in the art incorporate depositing vaporized superconducting oxide films simultaneously onto first and second principal surfaces of the substrate as taught by Nagaishi et al instead of depositing vaporized superconducting oxide films on only one side as taught by Kimura to gain the advantages of forming vaporized superconducting oxide films with excellent quality and uniform thickness distribution in one process without any adhesion process to form devices with favorable characteristics and improved reliability.

Response to Arguments

Specification

6. The Applicant has withdrawn the substitute Specification; the objection is withdrawn.

Claim Objections

7. Applicant has amended the status identifiers; the objections are withdrawn.

112 Rejections

8. The Applicant has amended the claims to overcome the 112 rejections; the rejections are withdrawn.

102 Rejections

9. Applicant's arguments with respect to claims 1 and 3-5 have been considered but are moot in view of the new ground(s) of rejection due to the amended claims requiring new limitations such as converging the particulate material and increasing the density of the particulate material by guides for introducing the particulate material on the first and second principal surfaces.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent Nos. 4,882,023; 5,556,472; 6,805,916.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Band whose telephone number is (571) 272-9815. The examiner can normally be reached on Mon-Fri, 9am-5pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Keith Hendricks can be reached on (571) 272-1401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

Art Unit: 1723

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael Band/

Examiner, Art Unit 1723